

E (WPAT)

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TI - Antibacterial agents

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AB - (JP07173022-A)

Antibacterial agents where metal fine particles are supported to carriers

USE/ADVANTAGE - The agent is useful as antibacterial and antimould agent for medical clothes, textile goods, kitchen articles, bath articles, home electric machines, house instruments, building materials, etc. The agent is easy to handle, causes less aggregation of the metal particles, exhibits sufficient antibacterial effect with a less dosage and is effective for a long term.

Pref., the metal to be used is selected from the group of Ag, Cu, Zn, Fe, Hg, Sn, Pb, Bi, Cd and Cr, pref. Ag, Cu or Zn. Average particle size of the metal is greater than 0.2 nm and smaller than 200 nm, pref. 100 nm. Amt. of the metal fine particles to be supported to the carrier is 1 ppm to 40 wt. %, pref. 10 ppm to 5 wt. %. The carrier is such as a banded cpd., e.g., kaolinite, halloysite, pyrophyllite, imogolite (sic.), among them esp. ion-exchangeable ones, e.g., smectite, vermiculite, sepiolite, attapulgite, palygorskite, mica, etc.; porous materials, e.g., silica gel, alumina, magnesia, activated charcoal, titania, diatomaceous earth, pumice, chamotte, CaCO₃, BaSO₄, CaSO₄, AlPO₄, among them, esp. ion-exchangeable ones, e.g., zeolite, analcite, laumontite, natroliite, thomsonite, edingtonite, sodalite, cancrinite, gmelinite, erionite, offretite, phillipsite, gismondite, yugawaralite, heulandite, stilbite, brewsterite, mordenite, epistilbite, ferrierite, silica gel, alumina, magnesia, activated charcoal, titania, acid clay, etc. or their mixt.

In an example, [Washing of carrier] 2 g high purity Na-type montmorillonite powders (more than 99% of purity) were added to 40 ml HNO₃ aq. soln. (pH = 1) and stirred for 1.5 hrs. Montmorillonite was collected by centrifugal separation and washed with HNO₃ aq. soln. (pH = 1). [Ion-exchange] The montmorillonite was added to 0.85M AgNO₃ (20 ml), adjusted pH = 1 and 40 ml of volume and stirred for 24 hrs. to support Ag ions to the montmorillonite. After centrifugal separation, washed with HNO₃ aq. soln. (pH = 1), washed with water and air-dried. [Preparation of metal fine particles] The montmorillonite supporting Ag ions was added to 100 ml ethyleneglycol under nitrogen atmos. Then heated at 170 deg. C for 6 hrs., washed with ethanol and vacuum dried at room temp. for 24 hrs. to give the antibacterial agent supporting Ag fine particles. (Dwg.0/0)